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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/660,464	09/11/2003	Eisaku Katayama	02008.122001	4973

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EXAMINER

CARTER, AARON W

ART UNIT	PAPER NUMBER
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2624

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/660,464

Applicant(s)

KATAYAMA ET AL.

Examiner

Aaron W. Carter

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 9-23, 25, 26, 28, 31 and 32 is/are rejected.
- 7) ☒ Claim(s) 5-8, 24, 27, 29 and 30 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 9/03, 12/03, 9/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.

When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and *Warmerdam*, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).

In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See *Lowry*, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

Claims 31-32 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 31 defines a "program" embodying functional descriptive material. However, the claim does not define a computer-readable medium or memory and is thus non-statutory for that reason (i.e., "When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally

interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized” – Guidelines Annex IV). That is, the scope of the presently claimed “program” can range from paper on which the program is written, to a program simply contemplated and memorized by a person. The examiner suggests amending the claim to embody the program on a computer-readable medium or equivalent in order to make the claim statutory however. *Any amendment to the claim should be commensurate with its corresponding disclosure.*

Claim Rejections - 35 USC § 112

2. Claims 10-14, 20 and 28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 10 recites the limitation "the gray-scale image" in lines 13 and 14. There is insufficient antecedent basis for this limitation in the claim. A plurality of gray-scale images was previously indicated, however it is indefinite which one gray-scale image is being discussed in this limitation.

Claim 12 recites the limitation "the plurality of three-dimensional comparison images" in lines 4-5. There is insufficient antecedent basis for this limitation in the claim.

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Claim 20 recites the limitation "the rotating three-dimensional reconstruction image" in lines 3-4. There is insufficient antecedent basis for this limitation in the claim.

Claim 28 recites the limitation "the plurality of degrees of image coincidence" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim 28 recites the limitation "the plurality of three-dimensional comparison images" in line 4. There is insufficient antecedent basis for this limitation in the claim.

Claim 28 recites the limitation "the processing result" in lines 9 and 10. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4, 9, 10, 15-19, 21-23, 25, 26, and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by USPN 5,808,735 to Lee et al. ("Lee").

As to claim 1, Lee discloses a three-dimensional structure verification supporting apparatus for supporting verification of a three dimensional structure by verifying properness of a three-dimensional image indicating the three dimensional structure of a substance, comprising:

A comparison image generating unit for generating a three-dimensional comparison image by adjusting image quality of the three-dimensional image with image quality of a reference image of the substance which is obtained experimentally (Fig. 2A, elements 205-225, column 4, lines 44-57 and column 6, lines 21-40, wherein aligning and normalizing steps correspond to adjusting the image quality to generate a comparison image); and

A degree-of-image coincidence computing unit for computing degree of image coincidence between the three-dimensional comparison image and the reference image of the substance (Fig. 2b, element 235 and column 6, lines 41-56, wherein comparing the test and reference images corresponds to computing a degree of image coincidence).

As to claim 2, Lee discloses the three-dimensional structure verification supporting apparatus as claimed in claim 1, wherein said comparison image generating unit generates the three-dimensional comparison image by blurring the three-dimensional image in accordance with image quality of the reference image of the substance (Fig. 2A, elements 205-225, column 4, lines 44-57 and column 6, lines 21-40, wherein normalizing steps correspond to adjusting the image quality to generate a comparison image by blurring).

As to claim 3, Lee discloses the three-dimensional structure verification supporting apparatus as claimed in claim 1, wherein said comparison image generating unit generates the

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three-dimensional comparison image in accordance with the image quality of the reference image of the substance which is obtained experimentally by adjusting the image quality so that the degree of image coincidence between a three-dimensional image of a reference substance, of which a structure is known, and the reference image of the reference substance obtained by experimental structural analysis becomes the greatest (Fig. 2A, elements.205-225, column 4, lines 44-57 and column 6, lines 21-40, wherein aligning and normalizing steps correspond to adjusting the image quality to generate a comparison image for the purposes of obtaining the greatest degree of coincidence).

As to claim 4, Lee discloses the three-dimensional structure verification supporting apparatus as claimed in claim 1, wherein the three-dimensional image is a three-dimensional simulated image simulated by modeling in order to indicate three-dimensional structure of a substance (column 4, lines 44-50).

As to claim 9, Lee discloses the three-dimensional structure verification supporting apparatus as claimed in claim 4, further comprising a three-dimensional reconstruction image generating unit for generating a three-dimensional reconstruction image, which is a reference image of the substance, by processing a plurality of gray-scale images acquired by a transmission electron microscope (column 4, lines 44-47 and column 4, line 58 – column 5, line 2).

As to claim 10, Lee discloses the three-dimensional structure verification supporting apparatus as claimed in claim 1, further comprising:

A three-dimensional reconstruction image generating unit for generating a three-dimensional reconstruction image by processing a plurality of gray-scale images acquired by a transmission electron microscope (column 4, lines 44-47 and column 4, line 58 – column 5, line 2); and

A shading unit for generating a three-dimensionally shaded image, which is the three-dimensional image, by shading the three-dimensional reconstruction image, by shading the three-dimensional reconstruction image (column 5, lines 3-37), wherein

Said comparison image generating unit generates the three-dimensional comparison image using the three-dimensionally shaded image (column 4, lines 44-47); and

Said degree-of-coincidence computing unit utilizes the gray-scale image acquired by a transmission electron microscope as a reference image of the substance (column 4, lines 44-47).

As to claim 15, Lee discloses the three-dimensional structure verification supporting apparatus as claimed in claim 1, further comprising:

A comparison position data acquiring unit for acquiring a plurality of comparison position data indicating positions of a plurality of parts of the substance in the three-dimensional image (column 6, lines 41-56, wherein x-y locations correspond to position data); and

A reference position data acquiring unit for acquiring a plurality of reference position data indicating positions of the plurality of parts in the reference image (column 6, lines 41-56, wherein x-y locations correspond to position data), wherein

Said degree-of-image-coincidence computing unit computes the degree of image coincidence using the plurality of comparison position data and the plurality of reference position data (column 6, lines 41-56).

As to claim 16, Lee discloses the three-dimensional structure verification supporting apparatus as claimed in claim 15, further comprising:

A scaling unit for scaling one of the plurality of comparison position data and the plurality of reference position data into a state where the three-dimensional image or the reference image is expanded or reduced (column 6, lines 21-33, wherein normalizing the intensity corresponds to scaling), wherein

Said degree-of-image-coincidence computing unit computes the degree of image coincidence using the one of the plurality of comparison position data and the plurality of reference position data scaled by said scaling unit, and the other one of the plurality of comparison position data and the plurality of reference position data (column 6, lines 41-56).

As to claim 17, Lee discloses the three-dimensional structure verification supporting apparatus as claimed in claim 15, further comprising:

A rotation unit for rotating one of the plurality of reference position data and the plurality of comparison position data into a state where the three-dimensional image or the reference image is rotated (column 4, lines 51-56, wherein alignment corresponds to rotating), wherein

Said degree-of-image-coincidence computing unit computes the degree of image coincidence using the one of the plurality of comparison position data and the plurality of

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reference position data rotated by said rotating unit, and the other one of the plurality of comparison position data and the plurality of reference position data (column 6, lines 41-56).

As to claim 18, please refer to the rejection of claims 4 and 9 above.

As to claim 19, please refer to the rejection of claim 10 above.

As to claim 21, please refer to the rejection of claim 1 above.

As to claim 22, please refer to the rejection of claim 3 above.

As to claim 23, please refer to the rejection of claim 4 above.

As to claim 25, please refer to the rejection of claim 9 above.

As to claim 26, please refer to the rejection of claim 10 above.

As to claim 31, please refer to the rejection of claim 1 above.

Allowable Subject Matter

5. Claims 5-8, 24, 27, 29 and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. Claims 11-14, 20 and 28 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

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Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron W. Carter whose telephone number is (571) 272-7445.

The examiner can normally be reached on 8am - 4:30 am (Mon. - Fri.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


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